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The law of transboundary aquifers

The law of transboundary aquifers

Report of the Secretary-General

Summary

The present report, prepared pursuant to General Assembly resolution 63/124, contains comments and observations of Governments on the draft articles on the law of transboundary aquifers.

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I. Introduction

1. The present report has been prepared pursuant to General Assembly resolution 63/124, by the terms of which the Assembly decided to include in the provisional agenda of its sixty-sixth session an item entitled "The law of transboundary aquifers" with a view to examining, inter alia, the question of the form that might be given to the draft articles on the subject.

2. The Secretary-General, in a circular note dated 2 January 2009, drew the attention of Governments to the resolution, and reminders were sent out in December 2009 and February 2011.

II. Comments and observations received from Governments

Algeria

3. Algeria emphasized: (a) the importance of precise knowledge about the extent of shared water resources, their volume and their quality; (b) the importance of integrating the environmental dimension of sustainable development in the countries concerned, through appropriate protection and good-faith cooperation, for the equitable and reasonable utilization of aquifers; (c) the need to strengthen national regulatory measures and bilateral or subregional cooperation mechanisms in order to ensure the effective protection of aquifer water resources from all forms of pollution; (d) the importance of protecting the right of countries sharing aquifers to have access to sufficient quantities for their development needs; and (e) the importance of introducing mechanisms for exchanging information and knowledge about shared water resources and the conditions for their integrated management.

4. While highlighting the importance of bilateral and regional cooperation through the conclusion of agreements and the introduction of joint cooperation mechanisms between States sharing aquifers, Algeria expressed its readiness to cooperate fully in order to consider the best way to follow up on the draft articles at the sixty-sixth session.

Argentina, Brazil, Paraguay and Uruguay

5. Argentina, Brazil, Paraguay and Uruguay commented that the Ministers for Foreign Affairs of the four countries had signed the Agreement on the Guaraní Aquifer in San Juan, Argentina, on 2 August 2010; it was currently undergoing the legislative approval process in the four signatory countries. On the same day, the Ministers for Foreign Affairs of the four countries had also signed a Joint Declaration, in which they reaffirmed the political will to make progress on such programmatic elements as were needed for the timely and effective implementation of the Agreement.[1]

6. The Agreement would be particularly important as a political and technical instrument, as it sought to strengthen cooperation and integration among States

[1] Copies of the Agreement and the Joint Declaration are available for consultation at the Codification Division of the Office of Legal Affairs of the Secretariat.

parties and expanded the scope of concerted action for the conservation and sustainable use of the transboundary water resources of the Guaraní aquifer system, located on their territories.

7. The Agreement, which, inter alia, took into consideration General Assembly resolutions 1803 (XVII) on permanent sovereignty over natural resources and 63/124 on the law of transboundary aquifers and bore in mind the 1972 Stockholm Declaration on the Human Environment and the 1992 Rio Declaration on Environment and Development, represented an important contribution by the region, as it was the first international agreement on activities involving a transboundary aquifer.

Austria

8. Austria commented that it would be not be timely to decide on the final form of the draft articles at the sixty-sixth session.

9. In view of emerging State practice on the subject, the final form should be considered at a later stage, as this would allow time to assess whether the articles as currently drafted would stand the test of time.

China

10. China commented that, as the activities contemplated in draft article 1 (b) covered industry, agriculture, forestry and other domains, the scope would seem to be excessively broad, the threshold "impact" should be replaced with "significant impact".

11. Draft article 7 (2) should read: "aquifer States may establish joint mechanisms of cooperation"; the wishes of all States would be best respected if this measure were not couched in mandatory terms.

12. On draft article 8, the strengthening of exchanges of data and information by aquifer States should not be at variance with the limitations provided under their law. As presently formulated, the provisions were too strict, allowing derogations only for national defence or security (draft article 19). Given that a number of countries had restrictions on the provision of information to other countries, necessary provision should be made for other possible limitations on the exchange of data and information.

13. Draft article 16, on technical and financial assistance to developing countries, should be strengthened. Developing countries played only a limited role in cooperation relating to transboundary aquifers, and their capacity to manage such aquifers was generally rather weak. Accordingly, the provisions calling on developed countries to provide technical and financial assistance to developing countries should be further strengthened.

14. On the final form, conditions were not yet ripe for the development of a convention on transboundary aquifers. The issue of transboundary aquifers was somewhat complex and, given the current lack of any extensive State practice in this area, haste should be avoided in developing rules of international law on the matter. The draft articles could serve as general guidelines for the practice of States in this

area; in other words, they should take the form of a non-legally binding resolution or declaration.

15. China reserved the right to submit further comments on the draft articles.

Colombia

16. Colombia commented that, with regard to the second preambular paragraph, although the draft articles addressed transboundary aquifers and their management, there was a need to be cautious when referring to the drafting of a convention on the basis of the draft articles. There was a need to determine how an international and legally binding instrument would be applied and whether it would be in the interests of the countries concerned.

17. Concerning draft article 2, the phrase "... and their hydraulic connection with surface water" should be added at the end of the definition of "aquifer system". Under the definition of "recharging aquifer", the scope of the concept of "non-negligible amount of ... recharge" should be specified; otherwise, the interpretation of "non-negligible" could be subjective. The definition of "recharge zone", as currently worded, encompassed both surface and subsoil components of the zone contributing water to the aquifer. It would be worth specifying whether, in operational terms, a "discharge zone" included artificial and non-natural outlets of water originating from an aquifer, as the examples given in the text, which were natural, were merely indicative.

18. With regard to draft article 4, in general terms the criteria used therein to describe the utilization of aquifer resources must be revised. Specifically, the criterion "reasonable" was highly subjective and did not establish a clear parameter for the appropriate management of resources. The meaning of "comprehensive utilization plan" in subparagraph (c) in the context of the joint management of transboundary basins was not clear. Moreover, the meaning of "continuance of its effective functioning" in subparagraph (d) should be clarified. Did it refer to the extraction of a proportion of the volume of contemporary water recharge? What restrictions would apply to the utilization of aquifers that had no contemporary water recharge?

19. Concerning draft article 5 (1) (b), the reference to "other needs" could be overly broad and ultimately to the detriment of the equitable consideration of the interests and needs of States in the management of aquifers. With regard to the factors listed in draft article 5, the scope of paragraph (1) (d), on the contribution to the formation and recharge of the aquifer or aquifer system, was unclear, because the relationship between the formation of the aquifer and the criterion of sustainable use was not apparent; nor was the meaning of "the contribution to the formation" of the aquifer. It should also be determined whether "the contribution to the ... recharge of the aquifer" applied to water originating from certain economic activities, such as irrigation and leaks from aqueducts and drains. Moreover, it was not clear who would determine the weight of each factor in draft article 5 (1), especially if more than two States managed the aquifer, as the importance of each factor could be different for each State.

20. In relation to draft article 6, the Spanish translation of the title of the article was not appropriate. In English, the term "significant harm" meant "significant or

considerable harm". However, the Spanish adjective "*sensible*" did not clearly describe the extent of the harm. As regards paragraph 3, the proper action in the event of harm was mitigation, compensation or remediation, not elimination. Furthermore, the draft articles did not consider the harm caused when groundwater was contaminated by pollution loads.

21. Under draft article 8 (1), information related to hydrochemistry would be included in the exchange of hydrogeological information. However, there was no reference to information on the intrinsic vulnerability of aquifers to pollution or on current or potential land use. In relation to paragraph 2, the scale of work, methodologies and protocols to produce the missing information must be defined, in order to ensure reliability and comparability.

22. With regard to draft article 10, an evaluation should be made as to whether its scope should encompass the biodiversity associated with aquifers, a concept that included the notion of ecosystems, and not only the concepts of geographical location and dependence, which were very strict and somewhat static.

23. With regard to draft article 11 (2), a reference should be included to economic incentives to be agreed for the States in whose territory a recharge or discharge zone was located, in whole or in part, for the protection of those zones.

24. Draft article 13 (2) should specify the frequency of monitoring based on an agreed conceptual model of the aquifers or aquifer systems.

25. With regard to draft article 15 (2), a time frame should be defined for the provision of notification, to another State, by a State that implemented or permitted the implementation of planned activities which might affect a transboundary aquifer or aquifer system. The extent of the obligations should also be specified, as the rationale was not clear (for example, the other State might have "reasonable grounds" for believing that a particular activity might affect an aquifer). Likewise, the degree of probability of the activity being carried out and the extent to which the State in question had the means to make such an assessment should be taken into account. Furthermore, this obligation could be interpreted as a limitation on projects or activities in border areas, although it could be understood to be covered under existing environmental assessments and licences applicable to such activities.

26. With regard to draft article 17, it should be specified whether the concept of an "emergency situation" resulting from human conduct implied that there were grounds for administrative liability, and how that would relate to grounds for exemption or mitigation of liability, such as force majeure or unforeseeable circumstances. The expression "eliminate" in subparagraph 2 (b), referring to the harmful effect of an emergency, should be replaced by "remediation", in line with the suggestion regarding draft article 6 (see para. 20 above).

Czech Republic

27. The Czech Republic commented that the draft articles mostly concerned the utilization of groundwater resources and the related assessment of the effects of the planned activities; less attention was paid to preserving the quality and quantity of groundwater as an element of the environment, for example, they did not address the need to consistently improve groundwater quality. The term "significant harm", as

used in draft articles 6 and 12, set the threshold too high, and should be reconsidered.

28. In draft article 15 (3), a requirement should be included to refrain, during the course of consultations and negotiations between the States concerned, from implementing or permitting the implementation of a planned activity that may significantly affect a transboundary aquifer. A similar provision was contained in article 17 (3) of the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses.

29. With regard to the final form, the Czech Republic observed that, during previous debates on work of the Commission on the draft articles it had been in favour of the conclusion, at a future date, of an international convention based on the draft articles. At the same time, it recognized that the draft articles would serve as a guide for bilateral and regional agreements. This process was still far from complete, given that additional issues for consideration had been raised in debates in the Sixth Committee. Consequently, a definitive position on the final form would emerge only after an assessment had been made as to whether and how the principles contained in the draft articles were reflected at the bilateral and regional levels and after discussions on such additional issues had been held in the General Assembly.

Denmark

30. Denmark commented that it had no transboundary aquifers.

Egypt

31. Egypt commented that the term "transboundary aquifers" should be replaced with "shared transboundary aquifers" in all the draft articles; "transboundary aquifers or aquifer system" should be replaced with "shared transboundary aquifers or shared aquifer system".

32. With regard to technical terms in the draft articles, the standard definitions in the Arabic references should be used, rather than the literal translations from English. These general remarks applied in particular to articles 7 to 17 and 19.

33. With regard to draft article 1 (b), the term "other activities" was very broad and might lead to misunderstanding unless "activities" was explained.

34. With regard to draft article 2, the standard definitions in the Arabic references should be used, rather than the literal translations from English.

35. With regard to draft article 3, after the phrase "It shall exercise its sovereignty" the phrase "with regard to the rule of shared ownership" should be added.

36. With regard to draft article 4 (c), the words "and alternative water sources for" should be deleted. Groundwater should not be considered as an alternative to surface water or vice versa, because they are integrated resources; "alternative water sources" should not be a factor in developing the comprehensive utilization plan.

37. Draft article 5 (1) (g) should be deleted. The justification for the proposed deletion in draft article 4 (c) (see para. 36 above) applies.

38. With regard to draft article 6 (3), there should be a clear rule regarding significant harm, requiring the aquifer State whose activities were causing such harm to take all corrective measures to eliminate or mitigate such harm. The procedure for implementation and the authority in charge should be clearly stated in the article.

39. It was suggested that, in draft article 18, the phrase "and in the regions which are under occupation" be added, as appropriate.

40. A new draft article 20 on dispute settlement should be added, the text of which would read as follows: "In case of disagreements and conflicts on any explanation or in applying the terms of this agreement, the two aquifer States can have recourse to article 33 of the Charter of the United Nations to settle the dispute, unless the concerned aquifer States agree to another solution".

El Salvador

41. El Salvador commented that the subject was of a vital importance within the broader context of natural resource protection, considering that aquifers constituted the predominant reservoir and strategic reserve of freshwater storage on Earth.

42. The draft articles were based on State practice and on a number of existing bilateral and international agreements, with new operational rules added taking into account new risks and realities.

43. The acknowledgment and accurate assessment in the preamble that groundwater resources were vitally important and life-supporting in all regions of the world should serve as a frame of reference for interpreting each of the provisions, mainly those related to the protection and management of aquifers. In addition, the draft articles struck a balance between the rights and the obligations of States, as they acknowledged that States had sovereignty over aquifers located within their territory, but that such sovereignty must be exercised in accordance with all the obligations laid down in the draft articles and in international law.

44. The obligations set forth in the draft articles were in line with the general principles recognized under international environmental law, thus forming a coherent part of the existing legal corpus, which was intended to be conducive to sustainable development, access to shared natural resources, respect for the principles of precaution and prevention, and harmonious balance between sovereignty and responsibility, a notion applicable to international law in general.

45. With regard to environmental protection, El Salvador highlighted in particular the obligation of prevention, which was a fundamental norm given the irreversible nature of certain processes, such as the damage caused to water resources by excessive pollution and the extinction of animal and plant species, and the high cost of restoring the environment to its previous state, in cases where it is possible to do so. This obligation must be accompanied by the "proper management" stipulated in draft article 14, as that notion encompassed all the measures aimed at maximizing the long-term benefits of using aquifers, while protecting and preserving them.

46. While the draft articles did not elaborate on the consequences of non-compliance with the aforementioned obligations, they should nevertheless be supplemented by existing norms relating to State responsibility, either for internationally wrongful acts or for lawful acts that caused significant environmental damage. Such norms of State responsibility were widely recognized in international law and had been developed by the International Law Commission itself. Moreover, the principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities (resolution 61/36, annex) had a dual purpose: on the one hand, to ensure prompt and adequate compensation to victims of transboundary damage, and on the other, to preserve and protect the environment in the event of transboundary damage, especially with respect to mitigation of damage to the environment and its restoration or reinstatement. In this connection, the advisory opinion of the International Court of Justice on the *Legality of the Threat or Use of Nuclear Weapons* acknowledged that the existence of the general obligation of States to ensure that activities within their jurisdiction and control respected the environment of other States or of areas beyond national control was now part of the corpus of international law relating to the environment.

47. El Salvador agreed with the inclusion in the draft articles of obligations of States in which aquifers were located and those of States in general, since aquifers constituted a resource that must be protected, given their importance for all of humankind and for future generations, not just for the population of a specific geographic area. This was reflected, for instance, in draft article 18 on protection in time of armed conflict. That provision created an imperative that strengthened the obligations set forth in the Geneva Conventions and the Additional Protocols thereto by requiring States to protect their water resources directly, not only because of their inherent value but also because of their close link to the basic needs of the civilian population.

48. Draft article 16 on technical cooperation with developing States also reflected this comprehensive vision, as it required all States possessing the capacity and resources — rather than just those States sharing an aquifer — to participate in the bilateral process, aimed at promoting scientific, educational, technical, legal and other cooperation for the protection and management of these important water resources.

49. The decision as to the final form remained a vital one that would determine the future operation of the draft articles in the international sphere. El Salvador proposed that the draft be analysed in terms of its main focus of regulation. Aquifers were not isolated elements but formed part of an integrated system that also included human beings, and they even had an impact on other activities related to the sustainable development of States, such as agriculture and stockbreeding. It should also be borne in mind that this kind of resource was not only essential for life, but also fragile and practically irreplaceable, necessitating diligent and immediate action on the part of States. In view of those considerations, El Salvador considered that the final form of the draft articles should ensure their full effectiveness and should be conducive to appropriate measures for halting excessive extraction and pollution of groundwater resources as a result of, inter alia, high population growth and rapid economic development. From a legal standpoint, a convention would constitute a binding instrument that, by embodying the sovereign will of States, would make such measures enforceable. However, a convention was not the sole means of ensuring effectiveness, as it would be subject to the will of

individual States, which could choose not to adopt it. Ultimately, the final debate should focus on the form that would best ensure the implementation of the draft articles by the vast majority of States, with a view to reaching an agreement that guaranteed genuine protection for transboundary aquifers.

France

50. France reiterated its support for the recommendation of the Commission to the General Assembly as contained in paragraph 49 of its report (A/63/10).

51. Given the sophisticated nature of the subject and the underlying scientific issues involved, the draft articles required a thorough review by States. Accordingly, it was necessary to proceed in stages: States should first be given time to evaluate the draft articles based on their own practice and to make bilateral or regional arrangements, if needed. On the basis of State practice, the General Assembly would then be able to decide whether to elaborate a convention on the basis of the draft articles.

Lebanon

52. Lebanon commented that some of the articles were similar to — one might even say taken wholly from — the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses.

53. In draft article 2 (a), the definition of "aquifer" should be more detailed. For example, as indicated in the academic literature, there were confined aquifers, unconfined aquifers, renewable aquifers and fossil aquifers.

54. The draft articles were oriented towards States that had good-neighbourly relations with each other, not States that were in a state of conflict or war. They would depend on goodwill among participating States and on States having normal — and in fact good — relations and not being in a state of conflict.

55. It would be best for hydrogeologists to lay out the technical aspects, and then for lawyers to come in and formulate the legal model.

56. Draft article 2 (b) was not clear. Further hydrological study was required in order to determine when aquifers were hydraulically connected. Furthermore, the fundamental problem lay in determining the boundaries of an aquifer. In draft article 2 (c), the word "transboundary" was used, whereas the 1997 Convention used the word "international": its article 2 (b) read "'International watercourse' means a watercourse, parts of which are situated in different States". Unless there was a reason therefor, it would not be wise to use one term rather than the other, especially given that the definition of the two terms was the same in both the Convention and the draft articles. Draft article 2 (d) did not mention that recharge and discharge zones were subsumed by the term "transboundary aquifer". Either of those zones could be located in separate States. Draft article 2 (h) defined "discharge zone" as the zone where water originating from an aquifer flowed to its outlets, such as a watercourse, a lake and so forth. However, "watercourse" had already been defined in the 1997 Convention as "a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus" (article 2 (a)). This constituted the definition of

"unconfined aquifer". The definition of "discharge zone" therefore overlapped with the definition of international aquifers that appeared in the 1997 Convention, and should thus be amended in order to avoid duplication or any dispute about which of the two instruments should be applied with regard to rights and obligations.

57. There was a contradiction between draft article 3 and subsequent draft articles that provided for limitations and conditions which could give rise to disputes when applied in the future. Further, the concept of sovereignty over aquifers contradicted the concept of participation as set forth in the 1997 Convention.

58. While it might be easy to calculate present needs under draft article 4 (c), such might not be the case with regard to future needs. Each aquifer State could inflate figures in a way that would make utilization plans difficult to achieve, unless sufficient goodwill existed between States to cooperate with each other on an equitable basis. Given conflicting interests, that was not realistic, and equitable and reasonable utilization would be dependent on goodwill, not on legal provisions that were binding on the States concerned.

59. With regard to draft article 4 (d), the more scientific and comprehensible term "sustainable" should be used rather than "effective" in the phrase "prevent continuance of its effective functioning". It also made no mention of non-renewable fossil aquifers, which had no known recharge or discharge zones, such as the Nubian aquifer, located in Chad, Egypt, the Libyan Arab Jamahiriya and the Sudan; the aquifer in Algeria and Tunisia, which might extend to the Libyan Arab Jamahiriya and Morocco; and the Disi aquifer in Jordan and Saudi Arabia.

60. With regard to draft article 5 (1), all the factors relevant to determining equitable and reasonable utilization required truthfulness and trustworthiness on the part of States, as well as reliable figures. In draft article 5 (1) (a), on the population dependent on the aquifer, reference should be made to the population currently resident plus future natural increases, not artificial increases resulting from migration. Draft article 5 (2) required truthfulness and trustworthiness on the part of States, as well as reliable figures. The law could not be relied on to ensure that rights were respected and that utilization was equitable and reasonable.

61. Draft article 6 referred to the obligation of aquifer States to prevent significant harm, but made no mention of the obligation of recharge zone States not to deplete or pollute the water sources that recharged the aquifers.

62. With regard to draft article 11 (1), the question arose as to how verification could be carried out in recharge and discharge zones in other States while respecting sovereignty as provided for in draft article 3.

63. With regard to draft article 11 (2), as long as States did not gain direct benefit from the aquifer connected to the recharge and discharge zones in question, there was nothing to compel them to cooperate. This further demonstrated that States would have to cooperate with one another with honesty and trustworthiness and that they would have to place humanitarian concerns ahead of self-interest. It could only be reiterated that most of the provisions of the draft articles would be reliant on the principle of goodwill.

64. In draft article 12, the word "precautionary" in Arabic was not forceful enough. Furthermore, the phrase "significant harm" should be replaced with a more forceful expression, because the pollution of aquifers was more serious than the

pollution of surface water. It took a long time to undo the damage caused by such pollution, not to mention the fact that verifying such pollution would require disclosures that could be considered violations of sovereignty.

65. Draft article 14 again raised the question of goodwill, because the mechanisms contemplated would require countries to cooperate and to forgo national self-interest. It was important in this context to discuss a law that would protect rights. Furthermore, recharge and discharge zones should be included in the definition of "aquifer State" in order to give States in those zones a role in management, thereby ensuring that water management would be sound and comprehensive.

66. Draft article 15 (2) referred to planned activities which may affect an aquifer. This was compatible with draft article 6, which mentioned the obligation not to cause significant harm. Paragraph 3 provided for a mechanism to resolve conflicts over environmental effects. Unless both sides had the desire to reach a solution, such conflicts would be never-ending. This paragraph also mentioned an independent fact-finding body to which States might appeal for an impartial assessment, without identifying the composition of such a body.

67. With regard to draft article 17 (3), words should be added to the effect that such measures should be temporary and should not continue after the state of emergency had been lifted.

Libyan Arab Jamahiriya

68. The Libyan Arab Jamahiriya commented that, in the title of the draft articles, the words "the law of transboundary aquifers" should be changed to "the law of shared international aquifers".

69. The Arabic translation of certain words and phrases needed to be adjusted in the text as a whole, in particular in draft articles 2 (a), 2 (b), 2 (g), 5 (1) (e), 8 (2), 8 (3), 8 (4), 10, 11 (1) and 13 (2).

70. The law addressed the fair exploitation of shared aquifers, taking into account present and future needs, as well as alternative sources, without establishing priorities for the utilization of such aquifers.

71. In order to preserve historically acquired rights, the law should not apply to projects that were already under way.

72. In draft article 4, a clear definition of equitable and reasonable utilization must be formulated.

73. In draft article 5 (1) (c), a definition of natural characteristics should be given. The definition should include area, extent, thickness, water flow direction and hydraulic and chemical characteristics. In draft article 5 (1) (d), the phrase "contribution to the formation and recharge" should be replaced by "size of contribution to the formation and recharge".

74. The first part of draft article 10 should read: "Aquifer States shall take all appropriate measures to protect and preserve ecosystems that are within the area of, or dependent upon, their transboundary aquifers or aquifer systems ...".

75. Draft article 11 (2) required greater clarification.

Mexico

76. Mexico commented that the draft articles covered a wide range of important issues.

77. In the long term, it would be appropriate for such issues to be enshrined in an international legal instrument. However, before embarking upon the negotiation of a binding instrument, sufficient time should be allowed for further reflection. Such a period would also allow States to continue developing regional and bilateral practice, which might then provide input for the possible development of an international instrument. Any negotiation of such a treaty should guarantee that the rights and obligations assumed by States under other relevant international agreements were safeguarded.

78. The item should remain on the agenda of the General Assembly and should be taken up again in a few years so as to allow for a period of reflection, with consideration given to whether the practice of States was in conformity with the draft articles.

Oman

79. Oman commented that in draft article 4, an additional subparagraph (e) should be inserted reading: "No aquifer State may seek compensation for the period prior to the adoption of this law."

80. At the end of draft article 5 (1) (d), a phrase should be added reading: "taking into account relative utilization based on an agreement to be concluded between the aquifer States."

81. At the end of draft article 6 (2), a sentence should be added reading: "A distinction should be made between harm resulting from use or extraction of natural resources from areas within transboundary aquifers or aquifer systems and harm resulting from pollution of groundwater reservoirs by industrial projects in such areas".

82. The Arabic translation of certain words and phrases needed to be adjusted in the text as a whole, in particular in draft articles 2 (e) and 8 (3).

Panama

83. Panama commented that the International Hydrological Programme of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in Latin America promoted the joint UNESCO/Organization of American States Initiative on Internationally Shared Aquifer Resources Management in the Americas. The programme was launched in 2000, and the participation of Panama began in 2006. Only very general work had been done on the Sixaola River aquifer, shared by Panama and Costa Rica, while work on the joint Panama-Colombia Jurado aquifer had not begun.

84. Panama recommended the review of existing Central American water agreements and the adoption of a regional approach that encouraged the seeking of the assistance of experts from the International Hydrological Programme in

delimiting aquifers and agreeing on presumed rights, a matter that had not yet been resolved in the region. In the view of Panama, therefore, a universal resolution should not be approved to address a local problem.

Philippines

85. The Philippines commented that the "law of transboundary aquifers" was a historic and significant global initiative that laid down a significant framework strategy for the proper management of freshwater resources at the local and regional levels.

86. Freshwater movement and its dynamics were very dependent on differences in uptake rates or discharge by various States using the same aquifer system, structures and rates of recharge. Hence, each State should take on the responsibility to protect, conserve and sustainably develop transboundary aquifers within the context of equal and just sharing.

87. There was a need for a comprehensive assessment of the extent of transboundary aquifers and the status of their water quality. Aquifer systems extended beyond States' political boundaries, and the approach taken in managing aquifers should be based on the catchment basin, as the behaviour of water was closely linked within river basin and catchment basin hydrogeology and river basin topographic boundaries. It would also be necessary to complete the process of mapping of transboundary aquifers and to establish aquifer information and management systems and special and temporal management regimes for the resource with a view to policy- and decision-making.

88. There should be a governing law for all States to properly regulate the utilization of aquifer systems for the optional and sustainable management of the resource.

89. Transboundary aquifers should be properly defined in terms of hydrogeological configuration and water-surface influence. The designation of critically depleting aquifer systems or "hot spots" required priority bilateral or regional arrangements. There was also a need for the proper management and protection of the recharge zone to maximize the level of the aquifer system. Moreover, the identification of management strategies and principles, current values and threats of aquifer systems was crucial, as was the need for bilateral and regional responsibility.

Portugal

90. Portugal reiterated that the draft articles could contribute positively to the proper management of existing transboundary aquifers around the world.

91. As to the form, Portugal reaffirmed its belief that the draft articles should be developed into an international framework convention.

Saudi Arabia

92. Saudia Arabia commented that the draft articles did not seem to address (a) the prevention of lateral, diagonal or horizontal excavation within the water-bearing strata; (b) the lack of supply to other parties that were not aquifer States; (c) the fact that consideration should be given to the varying area, extent and thickness of the aquifer, its characteristics, and the direction in which the aquifer flowed, and the variations from one State to another in terms of population size; and (d) the use of pollutants and their impact on the aquifer or water system.

93. The draft articles made no distinction between arid desert regions with little rainfall and regions that had plenty of aquifers. Priorities must therefore be established for the utilization of transboundary aquifers in desert regions, where the first priority should be drinking water.

94. The draft articles addressed underground water sources that were hidden from view, and there were insufficient data and information regarding the huge variety of subterranean geological formations, including rifts and folds, that could impede and affect the rate of the flow of aquifers. However, the draft articles did not take such factors into consideration.

95. A mechanism should be developed for the sharing of experiences gained from successful experiments in managing water from transboundary aquifers.

96. The provisions of the draft articles covered aquifers and groundwater networks. However, in certain articles, inter alia, draft articles 6 (2), 7 (1), 8 and 9, reference was restricted to aquifers, and other networks were not mentioned.

97. The chapeau of draft article 1 should be changed to read: "The present draft articles aim to regulate the following:". A new draft article 1 (d) should be added, reading: "Priorities should be established for the use of shared groundwater and aquifers".

98. Draft article 2 (a) should be amended to read: "'aquifer' means a permeable water-bearing geological formation that may or may not be circumscribed, superimposed or underlain by a less permeable layer and the water contained in the saturated zone of the formation".

99. With regard to draft article 4, a precise definition should be given of the principle of equitable and reasonable utilization. The draft articles did not address, in a distinct manner, aspects concerning non-renewable aquifers, aquifers in desert regions or aquifers in areas where rainfall was plentiful. Draft article 4 (c) left things open to change and uncertainty: the needs of States fluctuated, and it might be better to establish fixed rules. Draft article 4 (d) was unclear and needed to be clarified or reformulated. A new draft article 4 (e) should be added, reading: "No State may renounce, lease or sell all or part of its right to utilize a transboundary aquifer to any State other than a State bordering that or another aquifer".

100. Draft article 5 (1) (c) should be amended to read: "Utilization should be in keeping with the natural characteristics of the aquifer or aquifer system within each State". Moreover, an additional factor should be included as follows: "(j) Consideration should be given to the area, extent and thickness of the aquifer, its characteristics, and the direction in which the aquifer flows".

101. With regard to draft article 6, there had to be a clear provision for irrevocable damage, and the State which had caused such damage must provide compensation. Provision must also be made for the manner in which compensation for such damage would be provided and the entity responsible for providing it specified.

102. With regard to draft article 7, greater detail was required with respect to "sovereign equality" and the principle of "territorial integrity", because aquifers were different from surface water (rivers), and it would be difficult to apply those terms to aquifers.

103. With regard to draft article 9, bilateral arrangements had positive and negative features. However, the expression "adversely affects" was ambiguous and needed greater specificity or definition in order to ensure that it was not misinterpreted. The term might give one or more States the right of veto unless the adverse impact referred to was more clearly defined with regard to paragraph 2 of the commentary on the draft article, the reference to "rare cases" ("When an agreement or arrangement is for the entire aquifer or aquifer system, all the aquifer States sharing the same aquifer or aquifer system are most likely to be involved except for some rare cases") needed to be clarified.

104. Draft article 12 should provide greater detail as to what was meant by "a precautionary approach" and the consequent obligations on a State should be made clear.

105. In draft article 16, the meaning of "States" in the phrase "States shall ... promote" should be specified; if it meant the States of the world, that should be made clear. In this draft article, the developed States should be urged to provide developing countries with methodological and scientific expertise for dealing with transboundary aquifers.

Slovenia

106. Slovenia welcomed and supported efforts to build on the existing international legislation on water protection with topics addressing transboundary aquifer management in greater detail. The draft articles presented a solid legal basis that would enable countries to coordinate, at a global level, adequate integrated solutions relating to the management of transboundary aquifers. Slovenia remained flexible on the form of the draft articles, whether legally binding or non-binding. In the management of transboundary aquifers, it was essential that States observe the provisions set forth in the draft articles.

107. The draft articles regulated issues that Slovenia was implementing proactively within bilateral and multilateral bodies tasked with transboundary cooperation in water management. As water management transcended geographical and political boundaries, Slovenia placed a focus on regional, subregional and bilateral forms of cooperation, with due consideration for the ecosystem approach and the comprehensive management of bodies of water. Fifty-one transboundary aquifers were registered in south-eastern Europe in the 2007 assessment of transboundary water resources conducted by the Economic Commission for Europe. According to other estimates, the number exceeded 60. Some Dinaric karst aquifers in Croatia, Bosnia and Herzegovina, Montenegro and Albania guaranteed a 15-90 per cent

utilized water share, attaining 100 per cent in some areas. Climate change and the threat of water shortages had made Dinaric aquifers all the more important.

108. Slovenia had recognized early on the significance of aquifers and their transboundary dimension. It was a party to treaties addressing water management. As a member of the European Union, it actively implemented and sought to attain the objectives of the community acquis on water management, in particular the European Union Water Framework Directive. Slovenia was also party to five bilateral treaties addressing water management, with Austria (relating to the rivers Mura and Drava), Italy, Hungary and Croatia; one subregional agreement (the Framework Agreement on the Sava River Basin); and one regional treaty (the Danube River Protection Convention). Cooperation and coordination took place in the context of the relevant commissions and expert groups.

109. Geothermal utilization was also an important aspect of transboundary groundwater management. It was an aspect which had gained importance as concessions and rights for the exploitation of geothermal potential had been granted in individual countries. It was now being discussed with Austria and Hungary in the relevant commissions.

Spain

110. Spain commented that directive 2000/60/EC of the European Parliament and of the Council established a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. Spanish and European legislation clearly established the frameworks needed for the proper management of freshwater, surface water and groundwater resources, and questions regarding the transboundary aquifers in the Iberian peninsula fell within the purview of the Spanish-Portuguese district and the Ebro district.

111. Under the Agreement on Cooperation for the Protection and Sustainable Use of the Waters of the Spanish-Portuguese Hydrographic Basins (the Albufeira Agreement), aquifers were dealt with in an almost incidental fashion, probably owing to the scarcity of aquifers common to Spain and Portugal, which were limited to the hydrogeological units of Bajo Miño, Ciudad Rodrigo-Salamanca, Moraleja and Vegas Bajas. The Ebro basin also had an international segment, and agreements and treaties had been concluded and were in force between France and Andorra. These guaranteed cooperation for achieving the environmental objectives for water deposits, and groundwater was included in that context.

Turkey

112. Turkey indicated that its comments were additional to those contained in document A/CN.4/595. With regard to draft article 1 (b), it was not clear what was meant by "other activities". It should be deleted with a view to preventing any ambiguity that might be derived from its interpretation. Under draft article 1 (c), as amplified in draft article 3, cooperation to be carried out by riparian States might not always result in common management of such aquifers or aquifer systems. The following text was proposed therefor: "Measures which can be taken for the protection and preservation and management of such aquifers or aquifer systems by the aquifer State".

113. The rationale applied above with regard to draft article 1 (c) also applied to draft article 4 (c). It might therefore be modified to read: "They may establish individually or jointly, as appropriate, utilization plans, taking into account present and future needs of, and alternative water resources for, the aquifer States."

114. With regard to draft article 5 (1) (f), it was not clear what was meant by "potential effects of the utilization of the aquifer or aquifer systems in one aquifer State or aquifer system". Accordingly, it should be deleted. Draft article 5 (1) (g) should also be deleted. Although reference was made therein to the availability of alternatives to a particular existing and planned utilization of the aquifer or aquifer system, integrated water resources management already took into account hydrological, social, economic and environmental aspects and focused on what was useful, sustainable, feasible, equitable and environmentally friendly, without any factor prevailing with regard to the exploitation of water resources in a basin. Moreover, neither groundwater resources nor surface water resources could be treated as an alternative to the other; they were complementary. Alternative water resources would thus already be a part of the plan. Some examples of "vital human needs" in draft article 5 (2) should be enumerated in order to avoid any divergent interpretations.

115. The debate on the interpretation of "significant harm" in draft article 6 and the definition of appropriate thresholds of significant harm continued. Although the concept "to prevent causing significant harm" was used in most international codes, it was vague, relative and difficult to apply. Furthermore, appropriate measures to prevent the causing of significant harm would be difficult to take without certain thresholds. On the other hand, in groundwater resources even exploitation or a small amount of contamination could be interpreted as significant harm. On the whole, the draft article was ambitious and should be modified as follows:

> "1. Aquifer States shall, in utilizing a transboundary aquifer or aquifer system in their territories, pay due diligence to prevent the causing of significant harm to other aquifer States.
>
> "2. Aquifer States shall, in undertaking activities other than utilization of a transboundary aquifer or aquifer system that have or likely to have, an impact on that transboundary aquifer or aquifer system shall refrain from causing significant harm through that aquifer or aquifer system to other aquifer States.
>
> "3. Where significant harm nevertheless is caused to another aquifer State, the aquifer States whose activities cause such harm shall try, in consultation with the affected State, to eliminate or mitigate such harm, having due regard for the provisions of draft articles 4 and 5."

United States of America

116. The United States of America commented that the work on transboundary aquifers constituted an important advance in providing a possible framework for the reasonable use and protection of underground aquifers, which were playing an increasingly important role as water sources for human populations. For all States, and especially those struggling to cope with pressures on transboundary aquifers, the efforts of the Commission to develop a set of flexible tools for using and protecting these aquifers had been a very useful contribution.

117. Nevertheless, there was still much to learn about transboundary aquifers in general, and specific aquifer conditions and State practice varied widely. The draft articles also went beyond current law and practice. For those reasons, the United States continued to believe that context-specific arrangements, as opposed to a global framework treaty, provided the best way to address pressures on transboundary groundwaters. As decided in resolution 63/124, States concerned should take into account the provisions of the draft articles when negotiating appropriate bilateral or regional arrangements for the proper management of transboundary aquifers. Numerous factors might appropriately be taken into account in any specific negotiation, such as the hydrological characteristics of the aquifer at issue; current uses and expectations regarding future uses; climate conditions and expectations; and economic, social and cultural considerations. Maintaining the articles in their present, draft form was suitable for those purposes.

118. The United States remained unconvinced that, if the draft articles were fashioned into a global treaty, the treaty would garner sufficient support. It recognized, however, that many States had expressed an interest in such a framework convention. If the draft articles were to take the form of a treaty, there were a number of important issues that the United States believed would need to be addressed. For example, appropriate final clauses for a convention would need to be developed, as well as articles that established the relationship between the proposed convention and other bilateral or regional arrangements. In particular, care would need to be taken not to supersede existing bilateral or regional arrangements or to limit the flexibility of States entering into such arrangements.

League of Arab States

119. The League of Arab States, conveying the views of its members, commented that the title should read "Law on shared international aquifers". There should also be an article on dispute settlement. The references in the draft articles to "transboundary aquifer(s)" and "aquifer system(s)" should be replaced throughout the text by "shared international aquifer(s)" and "shared international aquifer system(s)". When technical terms were used in the draft articles, standard definitions in Arabic should be used instead of literal translations thereof from English.

120. After the third preambular paragraph, a new preambular paragraph should be added, reading: "*Affirming* the relevant articles and principles set forth in the Convention on the Law of the Non-navigational Uses of International Watercourses".

121. The penultimate preambular paragraph should read: "*Emphasizing* the need to take into account the special situation of developing countries, and areas under occupation".

122. In draft article 1 (c), the reference to "preservation" should be deleted.

123. With regard to the definition of "recharge zone" in draft article 2 (g), the following should be added at the end of the sentence: "and other sources of water and the area in which that water percolates into the aquifer through soil". Draft article 2 (h) should read: "(h) 'discharge zone' means the zone where water

originating from an aquifer discharged to its outlets, such as a watercourse, a lake, an oasis, a spring, a wetland or an ocean".

124. Draft article 4 (c) should read: "(c) They shall establish individually and jointly a comprehensive utilization plan, taking into account present and future needs of, and alternative water sources for, the aquifer States; and factors related to equitable and reasonable utilization". In draft article 4 (d), the words "natural and" should be added, so that the last part of the subparagraph would read: "at a level that would prevent continuance of its natural and effective functioning".

125. Draft article 5 (d) should read: "(d) The size of the contribution to the formation and recharge of the aquifer or aquifer system". The first part of draft article 5 (2) should read: "The States concerned shall determine the weight to be given to each factor, to be determined by its importance with regard to ...".

126. In draft article 6 (1), (2) and (3), the words "in whose territory" should read "within whose territory".

127. In draft article 8 (1), the words "regular basis" should read "regular and periodic basis". In draft article 8 (2), the words "best efforts" should read "utmost efforts", and in draft article 8 (3) and (4), "best efforts" should read "utmost endeavours".

128. The first part of draft article 10 should read: "Aquifer States shall take all appropriate measures, to the extent their circumstances permit, to protect and preserve ecosystems ...".

129. Draft article 12 should be amended as follows: "Aquifer States shall, individually and, where appropriate, jointly, or in cooperation with the relevant international organizations, prevent, reduce and control pollution ..., including through the recharge processes, that may cause significant harm to other aquifer States. Aquifer States shall take a precautionary and preventive approach ...".

130. In draft article 13 (2), the word "parameters" should be replaced with the word "factors".

131. At the end of draft article 16 (c), the words "and financial assistance" should be added; and in draft article 16 (d), the word "capacity" should read "capacities".

132. Draft article 17 (3) should read: "Where an emergency poses a threat to vital human needs, aquifer States, notwithstanding articles 4 and 6, may decidedly take measures that are strictly necessary to meet such needs".

133. The last report of draft article 18 should read: "... the principles and rules of international law applicable in international and non-international armed conflict and in areas under occupation and shall not be used in violation of those principles and rules".